

**WHAT IS CLAIMED IS:**

1. A signal transmission apparatus in a mobile communication system, comprising:
  - 5 a frame segmentation section for segmenting an input frame into k bit groups;
  - a first group of encoders for encoding the k bit groups and outputting encoded symbols;
  - a second group of encoders for encoding at least two bit groups among
    - 10 the k bit groups and outputting encoded symbols; and
    - a transmission section including a plurality of antennas in groups of a predetermined number of antennas, the number N of the antennas being larger than k, the transmission section transmitting the symbols encoded by each of the encoders in the second group via at least one antenna of the grouped antennas.
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2. The signal transmission apparatus of claim 1, wherein the encoders are trellis encoders.
3. The signal transmission apparatus of claim 1, wherein the total
  - 20 sum  $N_k$  of numbers of antennas in the groups of antennas is larger than N.
4. A signal transmission method in a mobile communication system, comprising the steps of:
  - segmenting an input frame into k bit groups;
  - 25 encoding, by a first group of encoders, the k bit groups and outputting encoded symbols;
  - encoding, by a second group of encoders, at least two bit groups among the k bit groups and outputting encoded symbols; and
  - grouping N antennas in groups of a predetermined number of antennas,
    - 30 N being larger than k, and transmitting symbols encoded by at least one encoder

of the second group of encoders via at least one antenna of the grouped antennas.

5. The signal transmission method of claim 4, wherein the encoded symbols are symbols encoded by a trellis encoder.

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6. The signal transmission method of claim 4, wherein the total sum  $N_k$  of numbers of antennas of the groups of antennas is larger than  $N$ .

7. A signal reception apparatus in a mobile communication system,  
10 comprising:

$M$  antennas connected to a receiver;

$k$  decoders,  $k$  being smaller than  $M$ ; and

a decomposer for decomposing at least one reception symbol of  $M$  reception symbols output from the receivers and outputting the decomposed  
15 symbol to at least two of the decoders.

8. The signal reception apparatus of claim 7, wherein the decoders are trellis decoders.

20 9. The signal reception apparatus of claim 7, wherein the antennas are in groups of a predetermined number of antennas.

10. A signal reception method in a mobile communication system, comprising the steps of:

25 receiving signals via  $M$  antennas connected to a receiver; and  
outputting at least one reception symbol of  $M$  reception symbols output from the receivers to at least two decoders of  $k$  decoders,  $k$  being smaller than  $M$ .

11. The signal reception method of claim 10, wherein the decoders  
30 are trellis decoders.

12. The signal reception method of claim 10, wherein the antennas are in groups of a predetermined number of antennas.